A Decompositional Approach to Determining Visitor Preference Structure for Wilderness Recreation Attributes

Morgan P. Miles, Georgia Southern University
J.M. Bowker, USDA Forest Service

INTRODUCTION

The National Wilderness Preservation System as established by Public Law 88-577 has as a component of its multi dimensional mission to provide for the U.S. public a distinguishable and specific type of outdoor recreation encounter, wilderness recreation. This suggests that there is both a perceptual and measurable difference between the attributes that comprise a wilderness recreation experience and those that comprise a non-wilderness outdoor recreation experience. Cooksey, Dickinson, and Loomis (1982) support this proposition in an empirical assessment of environmental preferences.

OBJECTIVE

The primary objective of the present study is to suggest the application of a marketing methodology, conjoint analysis, as an alternative technique in the assessment of the attributes salient to the wilderness experience and their relative values. A secondary objective is to offer conjoint analysis as a vehicle to explore differences in attribute values attributable to the effects of sex, race, parenthood, age, extent of physical or mental challenge, or social class. A better understanding of the attributes, attribute levels, their importance to visitors in general and between various segments of the market is crucial for long term wilderness management policy and planning.

ATTRIBUTES OF IMPORTANCE TO THE WILDERNESS RECREATION EXPERIENCE

Cooksey, Dickinson, and Loomis (1982) define the traditional roadless wilderness as one of ten distinct leisure environments that provides recreation participants with an experiential context for psychological attributes such as: "contact with nature," "physical effort," "autonomy," "mental effort," "fatigue," "social contact," "contact with self," and "spending money." Watson (1983) developed a set of fifteen attributes in "backcountry country area selection" specific to Southern Appalachia that may offer insight into the attributes that differentiate the wilderness recreation experience from other outdoor recreation experiences. However, Watson's (1983) attributes may not be generalizable to other wilderness settings. A less site specific set of attributes adapted from Watson (1983) is summarized in Table 1.

TABLE 1
Attributes That Differentiate a Wilderness Experience from Other Outdoor Recreation Experiences

ATTRIBUTE[1]	PROPOSED LEVEL OF ATTRIBUTE FOR A WILDERNESS EXPERIENCE	PROPOSED LEVEL OF ATTRIBUTE FOR OTHER OUTDOOR EXPERIENCE
Distance on hiking trail between sources of water	Long	Short
Availability of hiking trails	High	High
Opportunity for obtaining an isolated campsite	High	Low
Probability of usage permits required	High	Low
Probability of campfires allowed	High	High
Number of wildlife likely to see	Many	Few
Number of hikers entering the trailhead	Few	Many
Trail configuration	Simple	Complex
Number of people typically encountered per day	Few	Many
Number of campsites	Few	Many
Number of Bears or other large wildlife seen last season	Many	Few
Size of area	Extensive	Limited
Number of scenic areas	High	Fewer
Level of regulation of camping	High	High

[1] Adapted from Watson (1983)

Watson's (1983) attributes were utilized in a subsequent study by Watson, Roggenbuck, and Williams (1991). These researchers found that as the subject's level of wilderness experience increased, the subject evaluated fewer attributes in recreation decision making. Since wilderness recreation consumption decisions are made on the basis of limited number of attributes, it is crucial for wilderness managers and planners to understand both the attributes of wilderness recreation decision making, and the context for which they are salient.

Convention, logic, and potentially more important current federal management practices suggest classifying the National Wilderness

Preservation System contextually into at least two categories: (1) sites West of the Mississippi River, and (2) sites East of the Mississippi River. Western sites tend to be much larger in area, more arid, with more outstanding scenic resources, and are typically less accessible to the U.S. population centers. Eastern wilderness sites tend to be smaller, wetter, less dramatic, but much more accessible to the population. Eastern sites, with their proximity to U.S. population centers, tend to be the most intensively used, and face crucial population, funding, and development pressures. Hence, the present study will focus on Eastern sites due to their strategic importance to the National Wilderness Preservation System's recreation resource base.

Eastern sites can be further sub-classified into mountain, coastal, piedmont, and wetlands. Attributes of potential importance to visitors in an Eastern wilderness context can be further categorized into attributes that are: (1) controlled by management and public policy, (2) biological, and (3) geophysical. Management and public policy controlled attributes may include: (1) fire management, (2) hunting and / or fishing, (3) grazing, (4) signage, (5) aircraft flyovers, (6) horses, (7) power tool utilization, (8) user fees, (9) user congestion, (10) proximity of clear-cuts, and (11) trail miles. Attributes of more of a biological nature include: (1) type of ecosystem, (2) fauna, and (3) flora. Geophysical attributes would typically include: (1) geologic formations, (2) type of area, (3) distance from home, (4) size, and (5) physical features of site. This classification scheme, corresponding attributes, and potential levels of attributes are summarized in table 2.

WILDERNESS AND ACCESSIBILITY

An additional issue in wilderness management pertains to the Federal policies that mandate that public recreation experiences are made accessible for all segments of society. Past studies suggest that all segments of U.S. society do not participate equally in wilderness related recreation (Craig 1972; Meeker, Woods, and Lucus 1973; Washburne 1978; Kelly 1980; Klobus-Edwards 1981; Miles, Ritzel, Cordell, and McDonald 1993; Miles, Good, McDonald, Schultz, and Capella 1993). This purported heterogeneity of participation in wilderness recreation may be, in part, explained by Wasburne's (1978) framework of ethnicity and marginality.

TECHNIQUES FOR MEASURING CONSUMER PREFERENCES FOR WILDERNESS ATTRIBUTES

Past wilderness recreation research efforts designed to measure consumer preferences for wilderness attributes have typically focused upon the utilization of compositional models. Compositional preference models, utilizing techniques such as regression or discriminant analysis, are often designed to develop single measure preference scores for wilderness activities, and are based upon the aggregation of the subjects' valuation of each attribute of the recreation experience.

TABLE 2
A Proposed Attribute Classification Scheme for Visitors at Eastern Wilderness Sites

ATTRIBUTE CATEGORY	PROPOSED ATTRIBUTE	LEVELS
Management and public policy	Fire Management	None, control only major fires, suppress all fires.
	Hunting / fishing	Do not allow, allow only with primitive weapons, allow consistent with state law.
	Grazing	Do not allow, limit the extent of it, allow as is.
	Signage	None, current level, more signage within the wilderness area.
	Aircraft flyovers	None, attitude minimums, noise limitations, open airspace.
	Horses	Do not allow, limit the extent of it, allow as is.
	Power tools utilization	None, emergency use only, management judgement allowed.
	User fees / permit	None, $5/day, $10/day
	User congestion	Require permit and limit number of permits, do not control.
	Proximity of clearcuts	Create buffer zone that surrounds the wilderness area, Do not manage.
	Trail miles	Extensive, limited.
Biological Coastal,	Type of eco-system	Mountain, Wetland, Piedmont.
	Fauna	Any rare or endangered species, quantity, diversity of wildlife.
	Flora	Any rare or endangered species, lush or barren, diversity of species, any champion trees.
Geophysical	Geologic formations	Size, diversity, color, suitability to climb, uniqueness.
	Type of area	Mountain, river, coastal, wetland.
	Size of site	Large, moderate, small
	Distance to site	Day trip distance, long weekend trip distance, week or more trip distance.
	Physical features	Overlooks, caves, waterfalls, streams, lakes.

This "additive" approach to preference structure modeling is not reflective of the decision making processes typical of consumers. A decompositional approach, such as conjoint analysis, provides a more realistic model of consumer information processing, by requiring the subject to select the most preferred recreation offering from a

set of competing multidimensional recreation service offering. Each recreation service offering is composed of a unique mix of attributes and levels of attributes. Decompositional models are congruent with high involvement consumer decision making models, where the consumer actively selects the "most preferred" product in the market constrained by their resources.

Conjoint analysis or trade-off analysis has been commercially utilized in new product and service development, market segmentation, and pricing studies since the early 1970's (Wittink and Cattin 1989; Wind, Green, Shifflet, and Scarbough 1989). For new product development analysis, conjoint allows the analyst to develop "prototypes" with various combinations of product attributes / attribute levels and then to determine which set of attributes optimizes utility for a specific market segment. Conjoint analysis as a segmentation and positioning tool allows the researcher segment the market by the relative importance of attributes as well as by demographics, behavioral patterns, geographics, or psychographics.

The application of conjoint or trade-off analysis to natural resource and recreation problems has been limited. Mackenzie (Forthcoming) utilized conjoint analysis in an analysis of attributes of importance to deer hunters. Manalo (1990) assessed the salience of apple attributes in an application of conjoint analysis applied to apple marketing. Wirth, Halbrent, and Vaughn (1990) used conjoint analysis in a product development and market segmentation study for farm raised hybrid striped bass.

The present study proposes that conjoint analysis be applied to assess the attributes of importance in Eastern wilderness recreation and to determine if there is a difference between sub-groups and the general population in attribute preference scheme as developed in Table 2. The application of conjoint analysis to assess the preference structure for wilderness recreation attributes will enhance management's understanding of the interrelationship between attributes and utility creation for various market segments. In addition, the application of conjoint analysis to wilderness recreation marketing should provide additional insight into the attributes of importance for segments in society that are traditionally underrepresented in wilderness recreation such as the physically challenged, Women, and minorities.

CONCLUSION

The application of conjoint analysis to assess visitor preferences for wilderness attributes will provide wilderness managers and policy makers with valuable insight into preferences for: (1) fire management, (2) hunting rights, (3) grazing, (4) signage, (5) flyover rights, (6) user fees, and (7) clear-cutting among others. This enhanced understanding of attribute preferences by social sub-groups should allow management to better design the wilderness experiences to appeal to segments that have been traditionally under-represented such as Hispanics, Women, the Elderly, or the mentally and physically challenged. In addition, the application of conjoint analysis to wilderness recreation will provide a more complete assessment of Wasburne's (1978) framework of ethnicity and marginality.

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